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1,96 R31SN

RESERVE

WATER SUPPLY OUTLOOK FOR ARIZONA



U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with

SALT RIVER VALLEY WATER USERS ASSOCIATION and

ARIZONA WATER COMMISSION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.



TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SURVEYOR ENROUTE TO THE MT. BALDY ARIZONA SNOW COURSE

SCS PHOTO AZ-5460

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 111, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	204 E. 5th. Ave., Room 217, Anchorage, Alaska 99501
Arizona	6029 Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P.O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 841 38
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82601

CONSERVATION OF WATER

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia

WATER SUPPLY OUTLOOK FOR ARIZONA

and FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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PRESIDENT
SALT RIVER VALLEY WATER
USERS ASSOCIATION

Report prepared by

RICHARD W. ENZ, Snow Survey Supervisor

SOIL CONSERVATION SERVICE ROOM 6029 FEDERAL BUILDING PHOENIX, ARIZONA 85025



Spring runoff south of Beaver Head

ARIZONA SUMMARY as of MARCH 15, 1976

NORMAL WATER SUPPLIES ARE GENERALLY EXPECTED IN ARIZONA THIS YEAR; HOWEVER, BELOW AVERAGE RUNOFF IS EXPECTED IN EASTERN ARIZONA DURING THE MARCH-MAY PERIOD.

SNOW COVER

Snow cover decreased at the lower elevations, but good increases occurred at some of the higher elevations. Heaviest snowfall continued to fall in the area between Flagstaff and Heber, while the lightest accumulations were observed in eastern Arizona and on the Gila Watershed in New Mexico.

Snow cover varies from 30% below average on the Gila to 55% above average on the Verde.

PRECIPITATION

Several light to moderate storms occurred at the higher elevations the first half of March. Two to three inches of precipitation was received along the eastern side of the Verde Watershed while most of the Gila Watershed received less than half an inch.

Total precipitation since November 1 ranges from 10% below average on the Gila and Little Colorado Watersheds to 25% above average on the Verde, with the Salt right at average.

SOIL MOISTURE

Surface soils are drying at the lower elevations, but soil moisture is still good above 7000 feet.

RESERVOIR STORAGE

Combined storage in the Salt River Project reservoirs is 63% of capacity and slightly above average for this date. San Carlos and Lake Pleasant are still below average, but most other reservoirs in the state are above.

Total storage in the Colorado River reservoirs is very good, with 80% of capacity and 60% above average.

STREAMFLOW AND WATER SUPPLY

Although several storms crossed Arizona in March, streamflow has dropped significantly due to the cold temperatures and relatively light precipitation at the lower elevations. As a result, most streamflow forecasts have been reduced. A really heavy storm accompanied by warm temperatures, however, could result in a very good runoff, but with only two or three weeks of good storm season left the probability of such an event is rather low.

Water supplies will be adequate this year in areas served by storage facilities, while some shortages are possible in the upper Gila Valley.

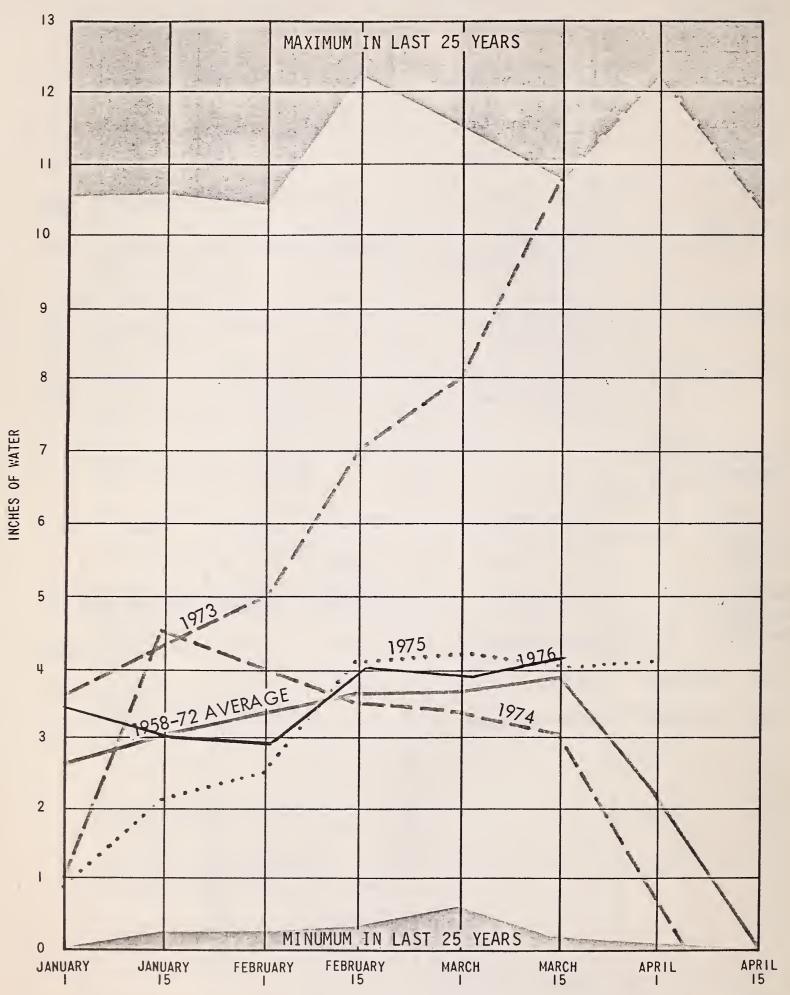
ABOUT MARCH

STREAMFLOW FORECASTS 15, 1976					PAST RECORD	
BASIN, STREAM and/or FORECAST POINT	FORE Thousand	Percent of	FORECAST	THOUSAND A		
BASIN, STREAT WING OF TORECAST FORM	Acre Feet	Average	PERIOD	Last Year	Average †	
SALT RIVER DRAINAGE Salt near Roosevelt	140 53	62 64	Mar-May March	404.3 132.4	224.6 81.9	
Tonto Creek near Roosevelt	14	61 61	Mar-May March	42.2	23.1 14.7	
Verde River above Horseshoe	102 61	89 101	Mar-May March	151.6 58.4	114.4	
Total Salt River Project Streams	246	68	Mar-May	598.1	362.1	
GILA RIVER DRAINAGE						
Gila River at Caiva	27	49	Mar-May	62.9	54.9	
Gila River near Gila	29	76	Mar-May	60.5	38.3	
Gila River near Solomon	54 2 5	60 54	Mar-May March	129.9	90.5	
Gila River near Virden	29	63	Mar-May	66.7	46.0	
Frisco River at Clifton	27	58	Mar-May	67.7	46.9	
Frisco River at Glenwood	11	53	Mar-May	36.5	20.6	
LITTLE COLORADO RIVER DRAINAGE Little Colo River above Lyman Dam Lake Mary Inflow Greer 1/	5.0 4.0 5.6	51 108 85	Mar-June Mar-May Mar-June	5.8	9.8 3.7 6.6*	
GRANITE CREEK DRAINAGE Granite Creek	2.0		Mar-May			
Willow Creek	0.7		Mar-May			
MIMBRES RIVER DRAINAGE Mimbres River nr. Mimbres	1.8	58	Mar-May	7.2	3.1	
COLORADO RIVER DRAINAGE Virgin River near Littlefield	39	90	Apr-June	22.5	43.2	
Colorado River - Lake Powell Inflow	6826	99	Apr-July	10,407	6,881	
1/ Corrected for Filler Ditch Dive 72. (*) Average is for less to	han 15 y	ears of	record.			
The Gila River near Solomon is April 20.	· capital		MI MUVE I	100 - 00 1	+ 1958-1972 perio	

BASIN or STREAM	RESERVOIR	Usable		Usable Storage			
	NESERVOIR	Capacity	This Year	Last Year	Average		
GILA RIVER DRAINAGE			,				
Agua Fria	Lake Pleasant	157.6	51.0	55.7	61.7		
Granite	Watson Lake	4.7	4.5	1.5	3.4		
Granite	Willow Creek,	6.1	2.5	0.9	2.8		
Gila	San Carlos	1,093	122.3	242.2	194.0		
Salt (4)	Roosevelt, Apache, Canyon & Saguaro	1,755	1145.8	1,094	112.4		
Verde (2)	Bartlett & Horseshoe	317.7	159.7	55.3	151,6		
Salt and Verde	6 Salt River Project Reser- voirs	2,073	1305.5	1,149	1,275		
COLORADO RIVER DRAINAGE							
Colorado	Lake Havasu	619.4	539.5	553.0	543.2		
Colorado	Lake Mohave	1,810	1727.6	1,663	1,712		
Colorado	Lake Mead	26,159	20,465	19,866	17,101		
Colorado	Lake Powell	25,002.	19,774	17,264	7,360*		
Little Colorado	Lyman	30.6	21.2	12.5	13.8		
Little Colorado	Show Low Lake	5.1	1.5	3.9	2.0		
+ Based on 15-yea	r period, 1958-72		<i>§</i> -				
* Average is for	less than 15 years o	f record.			t.		
		,			+ 1958-1972 period.		

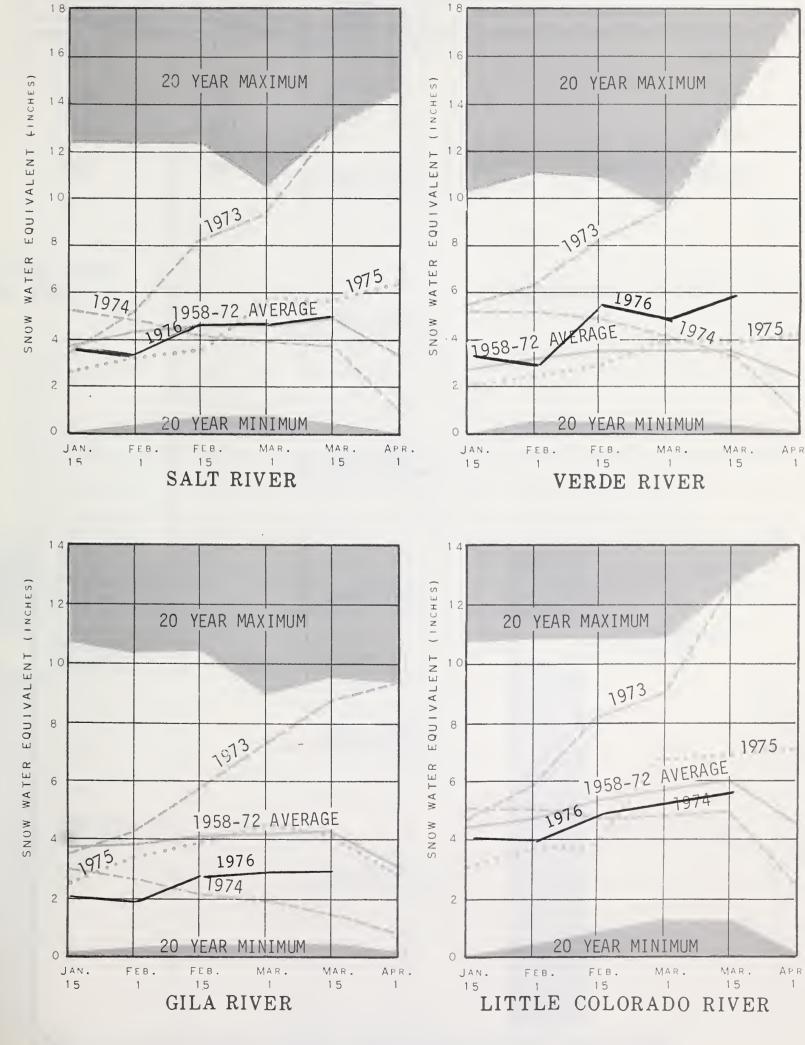
AVERAGE SNOW COVER ARIZONA

1976



This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

1976 WATERSHED SNOW COVER



ABOUT MARCH 15, 1976

RIVER BASIN and/or SUB-WATERSHED	VER BASIN and/or SUB-WATERSHED Number of Courses Averaged		THIS YEAR'S SNOW WATER AS PERCENT OF:			
	Averaged	Last Year Average				
Gila	10	71	72			
Salt	10	92	104			
Verde	10	150	155			
Little Colorado	5	82	92			
			•			
8						
			N.			
		è				

WATER SUPPLY INVENTORY SALT RIVER VALLEY SYSTEM

IN ACRE-FEET MARCH 15, 1976.

3,000,000

AVERAGE SUPPLY ON MARCH 15

ANTICIPATED 1976 SUPPLY *

2,500,000

2,000,000

Average Spring Runoff

Average Summer Runoff 1,500,000

1,000,000

Average Storage

500,000

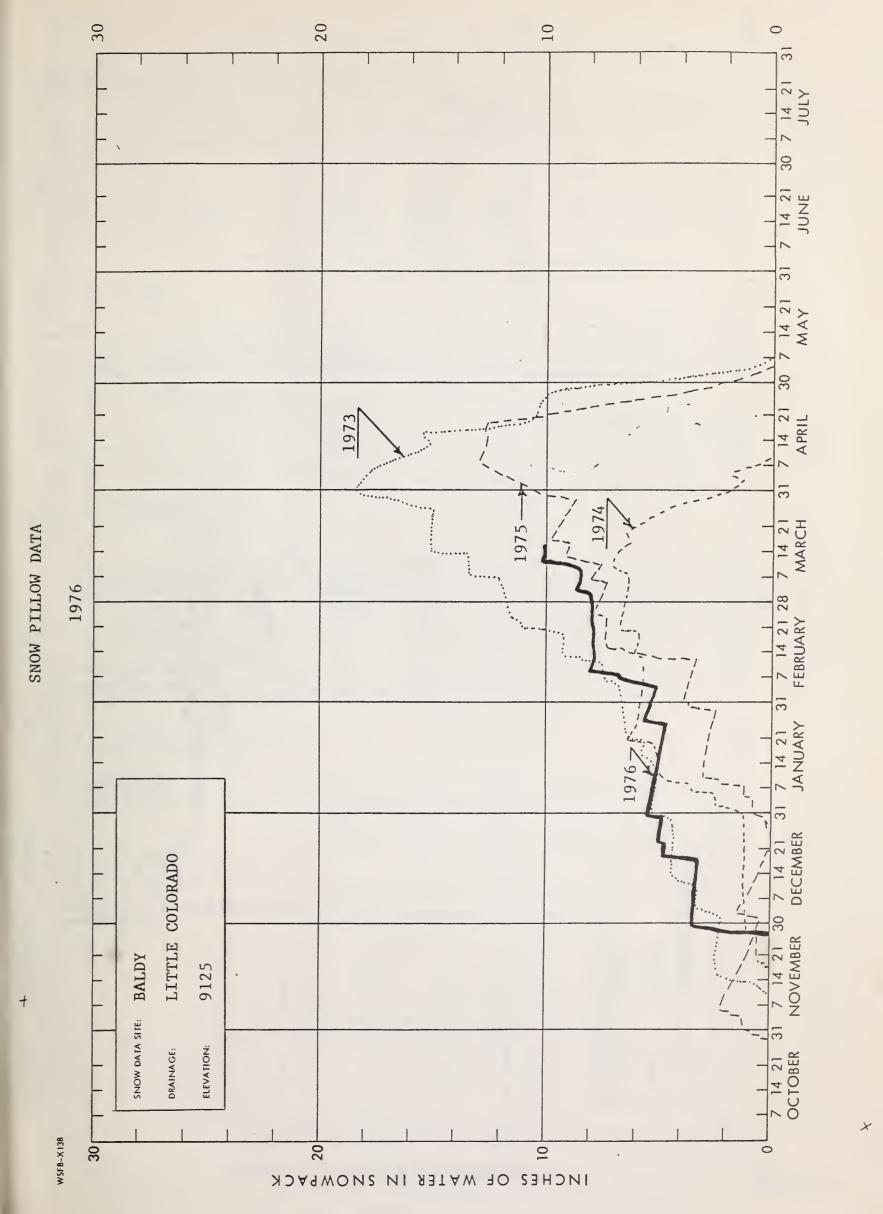
Forecast Runoff (March 15 - May)

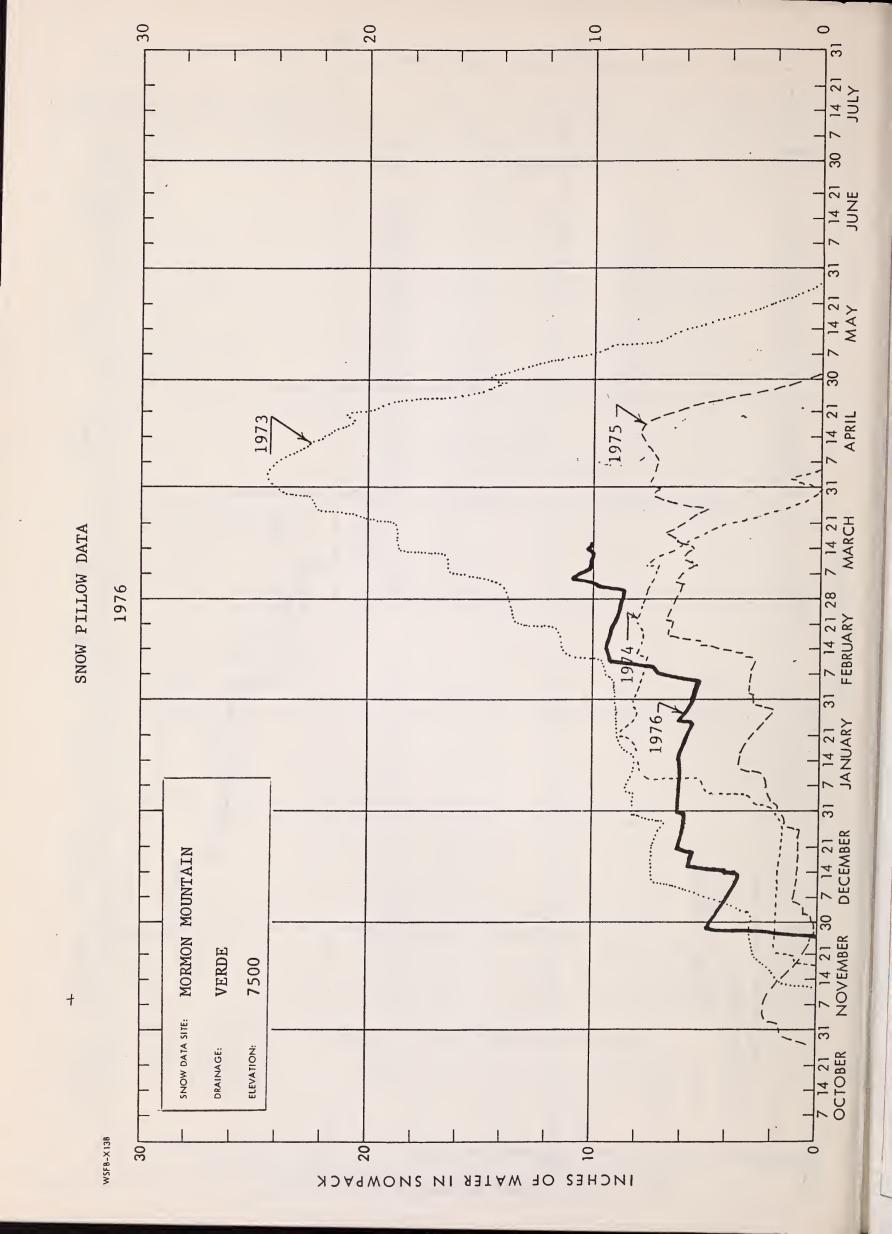
Average Summer Runoff

Present Storage

NOW ABOUT MARCH 15, 1976 DRAINAGE BASIN and/or SNOW COURSE			THIS YEAR		PAST RECORD Water Content (inches)	
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
			1			
GILA RIVER		2/1/		0.6		
Bear Wallow	8100	3/14	2	0.6	3.0	5.0
Beaver Head	8000	3/15	2	0.6	2.2	2.8
Coronado Trail	8000	3/15	T	0.1	2.4	2.2
Emory Pass #1 *	7800	3/15	0	0.0	0.0	0.3
Emory Pass #2 *	7800	3/15	. 0	0.0	T	0.7
Frisco Divide	8000	3/15	3	0.8	1.9	1.9
Hannagan Meadows *	9090	3/15	35	10.6	10.5	8.9
Hummingbird (A)	10550	3/15	40	13.6	20.3	16.3
McKnight Cabin * (A)	9300	3/15	4	1.2	6.8	2.5
Mogollon	7000	3/14	0	0.0	0.0	1.2
Nutrioso	8500	3/15	2	0.5	2.3	1.4
Redstone Trail	8600	3/14	21	7.2	8.6	7.4
Rose Canyon	7300	3/14	1	0.2	3.1	2.0
Silver Creek Divide	9000	3/14	30	9.8	11.5	12.2
State Line	8000	3/15	0	0.0	1.7	1.8
Whitewater (A)	10750	3/15	54	16.2	25.1	20.3
	20,30	3, 23				2010
/ERDE RIVER						
Baker Butte	7300	3/14	23	9.7	3.9	5.0
Baker Butte #2	7700	3/14	54	21.5	12.9	٥.٠
			0	0.0	ì	0 /
Camp Wood	5700	3/14	i .		0.5	0.4
Chalender *	7100	3/15	10	3.8	2.9	2.2
Copper Basin Divide	6720	3/12	2	0.7	1.6	1.2
Fort Valley	7350	3/15	3	0.7	0.4	2.0
Gaddes Canyon	7600	3/15	25	7.1	4.8	5.3
Happy Jack	7630	3/15	14	5.2	2.7	2.6
Iron Springs *	6200	3/12	1	0.2	0.5	0.4
Mingus Mountain	7100	3/1.5	0	0.0	1.0	0.7
Mormon Lake *	7350	3/15	21	7.4	3.6	3.4
Mormon Mountain	7500	3/15	27	10.1	5.8	4.7
Newman Park	6750	3/15	2	0.8	2.2	1.5
Snow Bowl #1	10260	3/15	40	11.9	12.1	9.9
Snow Bowl #2	11000	3/15	65	18.7	18.8	18.0
White Horse Lake Jct.	7150	3/12	12	4.3	2.8	3.2
White Spar	6000	3/12	T	0.0	0.9	0.4
Mormon Mt. Summit #2	8470	3/16	66	19.8		
OWER COLORADO RIVER						
Bill Williams Intermediate	8550	3/12	44	13.7		8.0
Bill Williams Summit	8950	3/12	55	16.6		11.1
Chalender *	7100	3/15	10	3.8	2.9	2.2
Fort Valley	7350	3/15	3	0.7	0.4	2.0
Grand Canyon	7500	3/15	0	0.0	2.2	1.2
Williams Ski Run	7720	3/12	43	13.2	8.2	7.0
				-	,	
1056 20 15	1.1		j.,,=	()	150 70 1	1:
1958-72 15-year period.						guste
Average. (A) Aerial obs	servation	: Water	content	estimati	ed.	

ABOUT MARCH 15, 1976 DRAINAGE BASIN and/or SNOW COURSE				PAST RECORD Water Content (inches)		
NAME	Elevation	Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average
			-			
ALT RIVER						
Baldy *	9125	3/15	29	8.6	9.0	7.5
Beaver Head	8000	3/15 -	2	0.6	2.2	2.8
Canyon Creek	7500	3/14	13	4.9	3.6	3.1
Canyon Point	7600	3/14	13	4.6	4.0	3.8
Coronado Trail	8000	3/15	T	0.1	2.4	2.2
	6430	1 '		1	0.0	0.4
Forest Dale		3/15	0	0.0		
Ft. Apache	9160	3/15	27	8.1	9.4	8.0
Hannagan Meadows	9090	3/15	35	10.6	10.5	8.9
Hawley Lake	8300	3/15	24	8.4	9.8	6.4
Heber	7600	3/14	11	4.3	3.7	3.3
Maverick Fork	9050	3/15 .	39	12.9	11.7	8.9
McNary	7,200	3/15	3	1.1	1.3	2.0
Milk Ranch	7000	3/15	0 "	0.0	0.7	0.8
Mt. Ord (A)	11000	NO	SURV	ΕΥ		23.8
Nutrioso *	8500	3/15	2	0.5	2.3	1.4
Promontory Butte	7930	3/15	51	18.0	12.5	
•	9850	N O	1	E Y	24.5	17.7
Smith Cienega (A)		1				1/ • /
Sunrise Summit	10600	3/12	56	15.9	17.2	13 /
Wilson Lake	9000	3/12	40	10.5	12.2	11.4
Workman Creek	6900	3/15	14	5.6	4.7	4.9
Canyon Creek Canyon Point Cheese Springs Forest Dale Ft. Apache Fort Valley Happy Jack * Heber Lake Mary McNary Mormon Lake Mormon Mountain Nutrioso * Promontory Butte	7500 7600 8600 6430 9160 7350 7630 7600 6970 7200 7350 7500 8500 7930	3/14 3/12 3/15 3/15 3/15 3/15 3/15 3/15 3/15 3/15	13 13 24 0 27 3 14 11 16 3 21 27 2 51	4.9 4.6 6.0 0.0 8.1 0.7 5.2 4.3 6.9 1.1 7.4 10.1 0.5 18.0	3.6 4.0 8.2 0.0 9.4 0.4 2.7 3.7 1.3 3.6 5.8 2.3 12.5	3.1 3.8 8.7 0.4 8.0 2.6 3.3 2.0 3.4 4.7 1.4
Snow Bowl #1	10260	3/15	40	11.9	12.1	9.9
Snow Bowl #2	11000	3/15	65	18.7	18.8	18.0
Wilson Lake	9000	3/12	40	10.5	12.2	11.4
Inner Basin #1	10100	3/16	62	19.3		
Inner Basin #2	9750	3/16	48	13.6		
Mormon Mt. Summit #2	8470	3/15	66	19.8		
1050 70 15	1 14 i A	l'acost	la dinaca	/**\	1958-72	Adiust
1958-72 15-year period	(*) Ad	gacent o	machage.			nay asi
Average. (A) Aerial o	oservation	4: water	content	estimat	ea.	





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PRECIPITATION (Inches)

ABOUT MARCH 15, 1976

DRAINAGE BASIN and PRECIPITATION GAGE LOCATION	ELEVATION	Date of	RENT INFORMA Month's	Average +	This Year	PROX. NOV. I	Percent of
		Reading	Precipitation	Average	THIS TOUT	/\veruge	Average
GILA RIVER							
Silver Creek Divide	9000	3/14	1.20	1.20*	11.35	13.02*	87
Hannagan Meadows **	9030	3/15	1.90	1.10	11.00	11.69	94
Frisco Divide **	8000	3/15	.95		6.54		
SALT RIVER							
Canyon Point	7600	3/14	2.77	1.83*	18.08	15.33*	118
Hannagan Meadows **	9030	3/15	1.90	1.10	11.00	11.69	94
Little Wildcat	7600	3/14	2.56	1.48	16.98	12.98	131
(Heber Snow Course)		0/15	1 00		10.00		110
Maverick Fork	9050	3/15	1.90	1.12	12.93	11.14	116
Workman Creek ** Wilson Lake	6970 9100	3/15 3/12	1.95 1.70	1.50 1.25*	18.02 11.29	15.78 11.74*	114 96
wilson Lake	9100	5/12	1.70	1.25	11.27	11.74.	70
VERDE RIVER							
Baker Butte	7300	3/14	2.87	1.68*	19.09	15.63*	122
Copper Basin Divide	6720	3/15	1.60	1.21*	14.05	10.30*	136
Fort Valley **	7350	3/15	1.66	1.03	8.61	8.05	106
Happy Jack **	7480	3/15	2.63	1.13	12.89	10.24	126
Mingus Mountain	7660	3/15	1.75	1.06	12.02	8.93	135
Mormon Mountain White Horse Lake Jct.**	7500 7150	3/15 3/12	3.50 2.00	1.51*	20.14	14.66*	137
white horse have see.	, 150	3,12					
LITTLE COLORADO							
Inner Basin #1	9830	3/16	3.20	1.50	11.55	14.34	81
Inner Basin #2	10050	3/16	4.00	1.74*	14.35	16.41*	87
Greer Lakes	8500	3/15	.50	.58	5.25	6.55	80
Little Wildcat	7600	3/14	2.56	1.48	16.98	12.98	131
(Heber Snow Course)	9125	3/15	1.62	1.11	10.75	10.78	100
Sheep Crossing (Baldy Snow Course)	9123	3/13	1.02	1.11	10.75	10.70	100
(baidy Show Course)							
+ 1058-70 Aughaca							
† 1958-72 Average * Adjusted Average							
** Data Supplied by							
U.S. Forest Service							

+ 1958-1972 period.

PRECIPITATION AT SELECTED ARIZONA STATIONS 1/

	Precipitation (Inches)					
STATION	MONTH: FEBRUARY	NORMAL FOR MONTH OF FEBRUARY				
Alpine	2.77	.96				
Crown King	11.57	2.75				
Douglas	.67	.58				
Flagstaff WSO*	5.93	1.47				
Grand Canyon	1.94	1.28				
Heber	2.77	.94				
McNary	2.04	- 2.18				
Payson Ranger Station	5.76	1.43				
Phoenix WSFO**	.47	.60				
Pleasant Valley	4.18	1.94				
Prescott (City)	4.43	1.36				
Safford	.82	.41				
Show Low	2.34	.96				
Sierra Ancha	5.59	2.50				
Springerville	. 26	.53				
Tonto Fish Hatchery	6.84	2.43				
Tucson WSO*	.53	.70				
Villiams	5.27	1.57				
Vinslow WSO*	.45	.38				
Yuma WSO*	1.20	.27				

SOU MOISTURE ABOUT MARCH 15, 1976

DRAINAGE BASIN and/or STA			e (Inches)	Date of	Soil Moisture (Inches)		
N ame	Elevation	Depth	Capacity	Survey	This Year	Last Year	Average
GILA RIVER					•		
Frisco Divide	8000	48	13.3	3/15	12.2	14.3	10.9
ALT RIVER							
Black River Divide	9100	48	16.8	3/15	17.6	18.2	16.6
Canyon Creek	7500	48	18.3	3/14	18.3	17.7	16.0
Corduroy Creek	6000	36	13.5	3/15	14.6	14.6	10.2
McNary	7200	48	16.3	3/15	17.9	17.9	15.4
ERDE RIVER							
Mormon Mountain	7500	48	16.1	3/15	17.0	17.8	16.4
Newman Park	6750	48	17.7	3/15	19.5	18.6	18.5
				ļ			
							-
						1	
. 1056 70 15	0 % 0 0 0						
+ 1958-72 15-year Ave	Muge						



The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

Department of Agriculture Soil Conservation Service Forest Service Apache-Sitgreaves Forest Coconino Forest Coronado Forest Gila Forest Kaibab Forest Prescott Forest Rocky Mountain Forest and Range Experiment Station Tonto Forest Department of Commerce NOAA, National Weather Service Department of Interior Bureau of Reclamation Region 111 Geological Survey Arizona District New Mexico District Bureau of Indian Affairs Fort Apache Reservation San Carlos Irrigation Project National Park Service Grand Canyon National Park Gila Water Commissioner Safford, Arizona

STATE

Arizona Game and Fish Department
Arizona State Parks Board
Arizona Water Commission
University of Arizona
Arizona Agricultural Experiment Station
Water Resource Research Center
Department of Watershed Management

MUNICIPAL

City of Flagstaff

IRRIGATION PROJECTS

Salt River Valley Water User's Association
Phoenix, Arizona
San Carlos Irrigation and Drainage District
Coolidge, Arizona
Maricopa County Municipal Water Conservation District

PRIVATE

Southwest Forest Industries, Inc.
McNary, Arizona
Fort Apache Indian Reservation
White Mountain Recreation Enterprises

UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ROOM 6029 FEDERAL BUILDING

PHOENIX, ARIZONA 85025

OFFICIAL BUSINESS PENALTY FOR PRIVATE USE, \$300

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FEDERAL - STATE - PRIVATE

COOPERATIVE SNOW SURVEYS

domestic and municipal water water supply for irrigation, supply, hydro-electric power necessary for forecasting generation, navigation, Furnishes the basic data mining and industry

"The Conservation of Water begins with the Snow Survey"